



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 26, 2023

Brigid D. Lowery, Director
Division of Assessment and Remediation
Office of Superfund Remediation
and Technology Innovation
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Mail Stop: 5201P
Washington, DC 20004

SUBJECT: CONSULTATION ON THE DECOMMISSIONING OF THE FORT CALHOUN
STATION, UNIT 1 IN WASHINGTON COUNTY, NEBRASKA

Dear Ms. Lowery:

This letter notifies you of the decommissioning oversight action that the U.S. Nuclear Regulatory Commission (NRC) has taken and intends to take for the Fort Calhoun Station, Unit 1 (FCS) in Washington County, Nebraska.

On October 9, 2002, the NRC, and the U.S. Environmental Protection Agency (EPA) entered into a Memorandum of Understanding (MOU) on "Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites" (Agencywide Documents Access and Management System (ADAMS) Accession Number ML022830208). Under the MOU, the EPA agreed to continue its deferral policy of not listing sites on the Comprehensive Environmental Response, Compensation, and Liability Act's (CERCLA) National Priorities List that are subject to the NRC's licensing authority. The MOU provides that, unless an NRC-licensed site exceeds any of three trigger criteria contained in the MOU, the EPA agrees to a policy of deferral to NRC decision-making on decommissioning without the need for consultation.

For sites that trigger the criteria in the MOU, the NRC will consult with the EPA at two points in the decommissioning process: (1) prior to NRC approval of the License Termination Plan (LTP) or decommissioning plan, which the NRC terms Level 1 consultation; and (2) following completion of the Final Status Survey (FSS), which the NRC terms Level 2 consultation. We are sending this letter as our Level 1 consultation for the FCS site because the licensee's proposed Derived Concentration Guideline Levels (DCGLs) for certain radionuclides at this site exceed the soil concentration values in Table 1 of the MOU.

The FCS site consists of a single Pressurized Water Reactor (PWR) which was licensed at 1,500 Mwt. The FCS site is located on the west bank of the Missouri River at river mile 646.0, approximately 19.4 miles north of Omaha, Nebraska. Omaha Public Power District (OPPD) is the licensee of the FCS site.

By letters dated June 24 and August 25, 2016 (ADAMS Accession Numbers ML16176A213 and ML16242A127), OPPD formally notified the NRC of its intention to permanently cease power operations at FCS in accordance with 10 CFR 50.82(a)(1)(i). On October 24, 2016, OPPD permanently ceased power operations at FCS. Pursuant to 10 CFR 50.82(a)(1)(ii), on November 13, 2016, OPPD certified to the NRC (ADAMS Accession Number ML16319A254) that as of November 13, 2016, all fuel had been removed from the FCS reactor vessel and placed into the FCS spent fuel pool. Pursuant to 10 CFR 50.82(a)(4)(i), the licensee submitted the FCS Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC on March 30, 2017 (ADAMS Accession Number ML17089A759). The PSDAR described the licensee's proposed decommissioning activities and schedule. At that time, the licensee stated its intention to move all the spent nuclear fuel into dry cask storage and place the facility in long-term storage (i.e., the "SAFSTOR" decommissioning option) as described in the PSDAR. By letter dated December 16, 2019, the licensee submitted an updated PSDAR (ADAMS Accession Number ML19351E355) to reflect that the decommissioning approach for the FCS was changing from SAFSTOR to the immediate decontamination and dismantlement of the facility (i.e., the DECON decommissioning option). By letter dated May 18, 2020 (ADAMS Accession Number ML20139A138), OPPD certified to the NRC that as of May 13, 2020, all spent fuel assemblies had been permanently transferred out of the FCS spent fuel pool and placed in storage within the Independent Spent Fuel Storage Installation (ISFSI).

Pursuant to 10 CFR 50.82(a)(9), OPPD submitted the FCS LTP to the NRC on August 3, 2021 (ADAMS Accession Number ML21271A144). As described in the LTP, OPPD is proposing to conduct remediation and survey operations of the FCS site (other than the remaining licensed ISFSI) to meet the unrestricted release requirements of 10 CFR 20.1402, "Radiological Criteria for Unrestricted Use." As described in the LTP a majority of the site is being farmed at the present time and it is planned that farming will continue. The licensee assessed the reasonably foreseeable future land use scenarios using the bounding Resident Farmer scenario as the compliance scenario.

The NRC has compared the licensee's proposed DCGLs to the MOU's soil concentration levels for the residential use scenario for the purposes of evaluating the need for consultation. Reliance upon the residential use scenario is consistent with the instructions for Table 1, "Consultation for Residential and Commercial/Industrial Soil Contamination," in the MOU, which state that the users of this table should select the appropriate column (i.e., land use scenario) based on the site's reasonably anticipated land use.

The proposed DCGLs for FCS are provided in the enclosure. OPPD has identified 24 radionuclides in its "initial suite" of potential radionuclides of concern (ROCs). They refined this list to just 4 ROCs (C-14, Cs-137, Eu-152, and Co-60) in soil with the remainder being insignificant contributors (ICs). The proposed DCGLs for three of the four proposed (ROCs), (C-14, Cs-137, and Eu-152), exceed the MOU soil concentration levels for the residential use scenario. A listing of the initial suite of radionuclides considered by the licensee, as well as the associated proposed DCGLs as compared to the MOU soil concentration levels for the residential use scenario is included for reference. These proposed DCGL values help to determine whether the associated radionuclides are considered significant, and also the amount that the proposed adjusted DCGLs for the proposed ROCs will be reduced during the FSS to account for all other radionuclides which may be present but will not specifically be addressed in the FSS.

The NRC staff note that in determining the Level 1 soil consultation trigger soil concentrations, the NRC staff applied the sum of fraction approach for all radionuclides other than Ra-226, Th-232, and total uranium. The sum of the fractions for the four proposed ROCs, assuming the

proposed surface soil and subsurface DCGLs for FCS is 6.47 and 3.99, respectively. The sum of the fractions for the initial suite of radionuclides, for the proposed surface and subsurface soil DCGLs is 72.29 and 11.98 respectively.

Prior to the NRC's termination of the license, the licensee must show that the FCS site will be in compliance with the NRC's criteria in 10 CFR 20.1402. The criteria in 10 CFR 20.1402 provide that the licensee must demonstrate, through its FSS in accordance with 10 CFR 50.82(a)(11)(ii), that the residual radioactivity that is distinguishable from background radiation results in an all-pathways total effective dose equivalent to an average member of the critical group that does not exceed 0.25 millisieverts per year (25 millirem per year). In addition, the 10 CFR 20.1402 criteria require that the residual radioactivity has been reduced to levels that are As Low As Reasonably Achievable (ALARA). The dose criteria in 10 CFR 20.1402 are fully protective of the public health and safety and were the result of a comprehensive rulemaking (62 FR 39058; July 21, 1997), including an accompanying generic environmental impact statement.

Individuals at a decommissioned site are expected to receive doses substantially below the constraint level because of the application of the ALARA principle, conservative dose modeling assumptions, and the nature of the cleanup process itself, which often reduces residual contamination levels significantly below site DCGLs. Additionally, the residual radioactivity at the site is expected to be much lower than the proposed DCGL values because meeting the "not to exceed 25 millirem per year" criteria must be demonstrated using an all pathways, sum of fractions approach. Each individual DCGL represents a concentration level corresponding to 25 millirem per year. Thus, in applying the sum of fractions requirement, the actual cleanup values will be reduced to ensure that the potential dose from all residual radioactivity at the site from all media is less than 25 millirem per year.

On-site monitoring wells have been sampled as part of an ongoing groundwater monitoring program. The NRC has determined that the licensee's proposed dose conversion factors for groundwater could potentially lead to concentrations that exceed the MCL concentrations, which triggers Level 1 consultation under the EPA MOU for groundwater. Therefore, the NRC is requesting a Level 1 consultation for groundwater.

Sample results from groundwater monitoring wells have detected tritium and strontium-90 above the detection limits but well below the EPA Maximum Contaminant Levels (MCL) for these radionuclides. Based on this historical groundwater monitoring performed at the site, the NRC does not expect the measured groundwater concentrations during the Final Status Surveys (FSS) to exceed the EPA MCLs. If the measured groundwater concentrations during the FSS does exceed the EPA MCLs, it would require a Level 2 consultation. The NRC will confirm its expectation at the time of FSS, and if necessary, request a Level 2 consultation.

Following your staff's review of the enclosure and other relevant information, as specified in Section V.D.1 of the MOU, please send us your views on the FCS site within 90 days of receiving this notification.

As part of the LTP review and approval process, the NRC staff will prepare an Environmental Assessment, which will be published in the *Federal Register*. The staff anticipates approving the LTP after the conclusion of the consultation process. Following site remediation activities, the licensee will submit an FSS. The NRC staff will review the information contained in this survey report and will compare the remaining levels of residual radioactivity to the MOU trigger levels. If the FSS measurements show that the remaining radionuclide concentrations are below the values set forth in Table 1 of the MOU as well as the final approved DCGL values, then the NRC will proceed to terminate the FCS license (except for the ISFSI) and the site will be released for unrestricted use. The NRC will inform the EPA of such findings. If the FSS measurements show that the remaining radionuclide concentrations are above the values set

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forth in Table 1 of the MOU, then the NRC will engage in Level 2 consultation with the EPA to identify and resolve any remaining issues.

In the meantime, if you have any questions regarding this letter or the remediation activities at the FCS site please contact Mr. Shaun Anderson, Chief of the NRC's Reactor Decommissioning Branch, at (301) 415-2039.

Sincerely,



Signed by Marshall, Jane
on 06/26/23

Jane E. Marshall, Director
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket Nos.: 05000285
License No.: DPR-40

Enclosure: FCS Proposed Cleanup Values
Summary of Referenced Documents with ADAMS Accession No.

cc: Fort Calhoun Service List
Stuart Walker, U.S. Environmental Protection Agency

SUBJECT: CONSULTATION ON THE DECOMMISSIONING OF THE FORT CALHOUN STATION, UNIT 1 IN WASHINGTON COUNTY, NEBRASKA
DATED: JUNE 26, 2023

DISTRIBUTION:

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GWarnick, RIV

SAnderson, RIV

ADAMS Accession No.: ML23082A220

*via e-Concurrence

OFFICE	NMSS:PM	NMSS	NMSS	NMSS	NMSS
NAME	*JParrott	*GChapman	*KPinkston	*LParks	*RFedors
DATE	04/20/23	06/08/23	06/08/23	06/08/23	06/08/23
OFFICE	NMSS	NMSS:BC	OGC	NMSS:D	
NAME	*TBarvitskie	*SAnderson	NMertz	*JMarshall	
DATE	06/08/23	06/13/23	03/30/23	06/26/23	

Fort Calhoun Station, Unit 1

Proposed Soil Cleanup Values (DCGLs) (picocuries per gram (pCi/g))
For Proposed Radionuclides of Concern (ROC)
with Adjustment
for Contribution from Insignificant Contributor (IC) Radionuclides

Proposed Radionuclide of Concern (ROC)	Proposed Surface Soil DCGL (pCi/g)	Proposed Subsurface Soil DCGL (pCi/g)	EPA MOU Residential Soil Concentration (pCi/g)
C-14	5.70E+01	9.68E+00	4.60E+01
Co-60	3.77E+00	2.93E+00	4.00E+00
Cs-137	1.31E+01	7.27E+00	6.00E+00
Eu-152	8.41E+00	7.36E+00	4.00E+00

NOTE: Proposed DCGLs in **bold** are those that exceed the consultation trigger limits from the EPA MOU Table 1 soil concentrations for the residential use scenario.

Fort Calhoun Station, Unit 1

Proposed Soil Cleanup Values (DCGLs) (pCi/g)
for Initial Suite of Radionuclides
with No Adjustment
for Contribution from Insignificant Contributor (IC) Radionuclides

Radionuclide Considered in Initial Suite	Proposed Surface Soil DCGL (pCi/g)	Proposed Subsurface Soil DCGL (pCi/g)	EPA MOU Residential Soil Concentration (pCi/g)
Am-241	1.40E+02	3.05E+01	1.87E+02
C-14	6.00E+01	1.02E+01	4.60E+01
Ce-144	2.75E+02	2.32E+02	N/A
Cm-243	6.75E+01	3.06E+01	3.50E+01
Cm-244	2.94E+02	5.77E+01	N/A
Co-58	3.63E+01	3.13E+01	N/A
Co-60	3.97E+00	3.09E+00	4.00E+00
Cs-134	6.42E+00	4.24E+00	1.60E+01
Cs-137	1.37E+01	7.66E+00	6.00E+00
Eu-152	8.86E+00	7.75E+00	4.00E+00
Eu-154	8.22E+00	7.17E+00	5.00E+00
Eu-155	3.08E+02	3.03E+02	N/A
Fe-55	3.66E+04	2.12E+04	2.69E+05
H-3	1.20E+04	8.66E+02	2.28E+02
Ni-59	1.13E+04	2.31E+03	2.08E+04
Ni-63	4.12E+03	8.42E+02	9.48E+03
Np-237	4.72E+00	7.62E-01	N/A
Pu-238	1.75E+02	3.54E+01	2.97E+02
Pu-239	1.58E+02	3.18E+01	2.59E+02
Pu-240	1.58E+02	3.19E+01	N/A
Pu-241	5.67E+03	1.04E+03	4.06E+04
Sb-125	2.66E+01	2.35E+01	N/A
Sr-90	1.11E+01	1.73E+00	2.30E+01
Tc-99	1.36E+02	1.54E+01	2.50E+01

NOTE: Proposed DCGLs in **bold** are those that exceed the consultation trigger limits from the EPA MOU Table 1 soil concentrations for the residential use scenario.

**Summary of Agencywide Documents Access and Management System (ADAMS)
Accession Numbers referenced in this letter.**

Document	ADAMS Accession No.
EPA/NRC Memorandum of Understanding (MOU) on "Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites" dated October 9, 2002.	ML022830208
For Calhoun, Unit 1 – Certification of Permanent Cessation of Power Operations, dated June 24.	ML16176A213
Fort Calhoun, Unit 1 – Certification of Permanent Cessation of Power Operations, dated August 25, 2016.	ML16242A127
Fort Calhoun, Unit 1 – Certification of Permanent Removal of Fuel from the Reactor Vessel, dated November 13, 2016.	ML16319A254
Fort Calhoun, Unit 1 – Post-Shutdown Decommissioning Activities Report, dated March 30, 2017.	ML17089A759
Fort Calhoun Station, Unit No. 1 – Post-Shutdown Decommissioning Activities Report, dated December 16, 2019.	ML19351E355
Fort Calhoun Station Unit No. 1, Independent Spent Fuel Storage Installation (ISFSI) Cask Registration and Certification of Permanent Removal of all Spent Fuel Assemblies from the Spent Fuel Pool, dated May 18, 2020.	ML20139A138
Fort Calhoun Station Unit 1, License Amendment Request (LAR) 21-01, FCS LTP Rev 0. Final - All	ML21271A144